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founded even by Scheele, for apples contain a portion of sorbic as well as of malic acid; but that these acids are different, Mr. Donovan proves by decomposing malate of lead by sorbic acid. For if water be boiled on malate of lead, no crystals are to be obtained on cooling the liquor; but when the malate is boiled in sorbic acid, the malate is decomposed; and the liquor, when cooled, deposits the peculiarly brilliant crystals of sorbate of lead.

In order to be well assured of the difference between these acids, Mr. Donovan compared his acid with as many as seven different specimens of malic acid obtained from different sources, and was confirmed in the opinion that they are essentially different, by comparison of various neutral salts obtained from each; those containing sorbic acid being in general to be procured in permanent crystals, while those from malic acid yield merely deliquescent residua when reduced to dryness.

The author remarks, that the purest malic acid is that prepared from the *Sempervivum tectorum*, which, according to the observation of Vauquelin, appears to be free from every other acid; while the juice of apples, unless they be taken very young, appears constantly to contain a portion of sorbic acid.

This paper concludes with conjectures respecting the progressive changes of vegetable products, and possible conversion of bitter principle into malic acid, sorbic acid, and oxalic acid; but the author is fully sensible that little reliance can be placed on such speculations.

*On the Structure of the Organs of Respiration in Animals which appear to hold an intermediate Place between those of the Class Pisces and the Class Vermes, and in two Genera of the last-mentioned Class. By Sir Everard Home, Bart. V.P.R.S. Read June 1, 1815. [Phil. Trans. 1815, p. 256.]*

The genera of animals here enumerated by the author, are the Lamprey, Myxine, an animal between the Lamprey and the Myxine, the *Aphrodita aculeata*, and the Leech.

In the Lamprey, the organs of respiration consist of separate oval bags, that have seven openings on each side of the neck, for receiving and emitting the water which they breathe by means of a cartilaginous thorax surrounding the bags. In the Lampern, which is of the same genus, the structure is very similar, but the cartilages of its thorax are weaker.

In an animal brought from the South Sea by Sir Joseph Banks, there are also the same number of external openings, and the same number of bags; but there is no cartilaginous thorax, and hence the author is induced to consider the animal intermediate between the Lamprey and Myxine, which it resembles in having teeth, and in having a mesentery to its intestines.

In the Myxine, there are only two orifices on the under surface of the neck; but these branch internally to six separate bags on each side.

In the *Aphrodita aculeata*, the organs of respiration differ so much from other animals of that tribe, that the author enters more minutely into the peculiarities of their structure. There are thirty-two openings between its tufts of bristles on each side, which lead to one large cavity on the back, into which project two rows of globular cells that communicate with the viscera, the use of which may admit of some doubt.

In the Leech, there are sixteen external orifices on each side under the surface of the belly, communicating with an equal number of distinct globular cells.

With respect to the respiration of the Lamprey, the author observes, that it naturally differs from that of fishes in general; for whilst they are attached by means of their mouths, the respiration could not then be carried on by means of that organ. A portion of the respired water may, however, be occasionally received into the œsophagus by a tube, with which all the bags communicate, and thence may pass into the stomach.

In the animal from the South Seas, which has no cartilaginous thorax, the respiration must be performed by the elasticity of the bags themselves.

In the Myxine, the author conceives that the water received by the two external openings is carried wholly into the œsophagus, and is then thrown out by an orifice that opens externally below those before described.

In the *Aphrodita* and Leech, the same openings which receive, also emit the respired water; and since in the latter the pressure of the bags is affected by the muscles of the body, their respiration must vary according to the degree of bodily exertion.

*On the Mode of Generation of the Lamprey and Myxine. By Sir Everard Home, Bart. V.P.R.S. Read June 15, 1815. [Phil. Trans. 1815, p. 265.]*

The present may be regarded as an addition to those reasons which the author lately gave for placing the Lamprey and Myxine in a rank intermediate between fishes and vermes; for instead of having distinct sexes, as is the case in perfect fish, Sir Everard Home observes that they are hermaphrodite.

He finds that the organs, which have been hitherto taken for kidneys in supposed females, are in reality testicles, and that the supposed males are really fish without spawn, in consequence of their not breeding two seasons together.